

What is claimed:

1. A radio transmitter module, comprising:

a pulser configured to receive a data stream comprising high and low signal values, and to generate a waveform comprising relatively narrow pulses corresponding to the high signal values;

a second pulser configured to receive a data stream comprising high and low signal values, and to generate a waveform comprising relatively narrow pulses corresponding to the high signal values;

a combiner couple with the first and second pulsers, the combiner configure to combine the waveforms generated by the first and second pulsers in order to generated a combined waveform; and

a filter configured to filter the waveform generated by the pulser and to shape the waveform so that it is suitable for transmission.
2. The radio transmitter module of claim 1, wherein the high signal values in the data stream associated with the first pulser represent a logic "1".
3. The radio transmitter module of claim 1, wherein the high signal values in the data stream associated with the second pulser represent a logic "-1".
4. The radio transmitter module of claim 1, wherein the combiner is configured to combine the two waveform by subtracting the waveform generated by the first pulser from the waveform generated by the second pulser.

5. The radio transmitter module of claim 1, further comprising:

a third pulser configured to receive a data stream comprising high and low signal values, and to generate a waveform comprising relatively narrow pulses corresponding to the high signal values;

a fourth pulser configured to receive a data stream comprising high and low signal values, and to generate a waveform comprising relatively narrow pulses corresponding to the high signal values;

a second combiner couple with the third and fourth pulsers, the second combiner configure to combine the waveforms generated by the third and fourth pulsers in order to generated a combined waveform; and

a second filter configured to filter the waveform generated by the pulser and to shape the waveform so that it is suitable for transmission.

6. The radio transmitter module of claim 5, wherein the high signal values in the data stream associated with the third pulser represent a logic "1".

7. The radio transmitter module of claim 5, wherein the high signal values in the data stream associated with the fourth pulser represent a logic "-1".

8. The radio transmitter module of claim 5, wherein the second combiner is configured to combine the two waveform by subtracting the waveform generated by the third pulser from the waveform generated by the fourth pulser.

9. The radio transmitter module of claim 5, further comprising an adder coupled with the first and second filters, the adder configured to add the shaped waveforms generated by the first and second filters.

10. The radio transmitter module of claim 5, wherein the waveform generated by the first filter is orthogonal to the waveform generated by the second filter.

11. The radio transmitter module of claim 1, wherein the first and second pulsers each comprise an AND gate configured to and the corresponding received data stream with a delayed version of the received data stream.

12. The radio transmitter module of claim 11, wherein the output of the AND gate associated with the second pulser is inverted.

13. The radio transmitter module of claim 5, wherein the third and fourth pulsers each comprise an AND gate configured to and the corresponding received data stream with a delayed version of the received data stream.

14. The radio transmitter module of claim 13, wherein the output of the AND gate associated with the fourth pulser is inverted.

15. The radio transmitter module of claim 1, wherein the first and second pulsers each comprise an edge detector.

16. The radio transmitter module of claim 5, wherein the third and fourth pulsers each comprise an edge detector.

17. The radio transmitter module of claim 5, wherein the first and second combiners are passive combiners.

18. The radio transmitter module of claim 5, wherein the third and fourth combiners are active combiners.

19. A transmitter, comprising:
a baseband circuit configured to generate a plurality of data streams; and
a radio transmit module coupled with the baseband circuit, the radio transmit module comprising:

a pulser configured to receive a data stream comprising high and low signal values, and to generate a waveform comprising relatively narrow pulses corresponding to the high signal values;

a second pulser configured to receive a data stream comprising high and low signal values, and to generate a waveform comprising relatively narrow pulses corresponding to the high signal values;

a combiner couple with the first and second pulsers, the combiner configured to combine the waveforms generated by the first and second pulsers in order to generate a combined waveform; and

a filter configured to filter the waveform generated by the pulser and to shape the waveform so that it is suitable for transmission.

20. The transmitter of claim 19, wherein the high signal values in the data stream associated with the first pulser represent a logic "1".

21. The transmitter of claim 19, wherein the high signal values in the data stream associated with the second pulser represent a logic "-1".

22. The transmitter of claim 19, wherein the combiner is configured to combine the two waveform by subtracting the waveform generated by the first pulser from the waveform generated by the second pulser.

23. The transmitter of claim 19, wherein the radio transmitter module further comprises:

a third pulser configured to receive a data stream comprising high and low signal values, and to generate a waveform comprising relatively narrow pulses corresponding to the high signal values;

a fourth pulser configured to receive a data stream comprising high and low signal values, and to generate a waveform comprising relatively narrow pulses corresponding to the high signal values;

a second combiner couple with the third and fourth pulsers, the second combiner configure to combine the waveforms generated by the third and fourth pulsers in order to generated a combined waveform; and

a second filter configured to filter the waveform generated by the pulser and to shape the waveform so that it is suitable for transmission.

24. The transmitter of claim 23, wherein the high signal values in the data stream associated with the third pulser represent a logic "1".

25. The transmitter module of claim 23, wherein the high signal values in the data stream associated with the fourth pulser represent a logic "-1".

26. The transmitter of claim 23, wherein the second combiner is configured to combine the two waveform by subtracting the waveform generated by the third pulser from the waveform generated by the fourth pulser.

27. The transmitter of claim 23, wherein the radio transmitter module further comprises an adder coupled with the first and second filters, the adder configured to add the shaped waveforms generated by the first and second filters.

28. The transmitter of claim 23, wherein the waveform generated by the first filter is orthogonal to the waveform generated by the second filter.

29. The transmitter of claim 19, wherein the first and second pulsers each comprise an AND gate configured to and the corresponding received data stream with a delayed version of the received data stream.

30. The transmitter of claim 29, wherein the output of the AND gate associated with the second pulser is inverted.

31. The transmitter of claim 23, wherein the third and fourth pulsers each comprise an AND gate configured to and the corresponding received data stream with a delayed version of the received data stream.

32. The transmitter of claim 23, wherein the output of the AND gate associated with the fourth pulser is inverted.

33. The transmitter of claim 19, wherein the first and second pulsers each comprise an edge detector.

34. The transmitter of claim 23, wherein the third and fourth pulsers each comprise an edge detector.

35. The transmitter of claim 23, wherein the first and second combiners are passive combiners.

36. The transmitter of claim 23, wherein the third and fourth combiners are active combiners.

37. A method of transmitting data in a wireless communication network, comprising:

generating a plurality of data streams;

generating waveforms comprising narrow pulses corresponding to each of the plurality of data streams;

combining certain of the waveforms to generate a plurality of combined waveforms; and

pulse shaping each of the plurality of combined waveforms.

38. The method of claim 37, further comprising adding the pulsed shaped waveforms to generate a single waveform and transmitting the single waveform.

39. The method of claim 37, wherein generating a waveform comprising narrow pulses for each to the plurality of data streams comprises ANDing each of the plurality of data streams with a delayed version of the data stream.

40. The method of claim 37, wherein generating a waveform comprising narrow pulses for each to the plurality of data streams comprises using a edge detector to generate the waveforms.